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THE GENUS PUCCINIA

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The present paper is a continuation of two previous attempts to bring to the notice of this society something of the efforts that are being made to devise a workable method that will eventually lead to a stable nomenclature for plants. The necessity for having one authoritative name for each species and genus of plants is conceded by all botanists. The methods proposed for arriving at this desirable state are various. It is evident that nomenclature will never become stable if left to itself, that is, to the judgment of the individual. There must be rules of procedure which most botanists, if not all, will feel bound to respect.

The wise formulation of such rules and the impress of authority, which they must necessarily bear, are difficult to secure. Were there an international organization of recognized competency to take up the matter, the way would seem easy. In the absence of such a body, suggestions and attempts must be expected from various sources, which may finally crystallize into a form which the botanical world at large will accept.

American botanists, acting through the American Association for the Advancement of Science, promulgated the Rochester-Madison rules of nomenclature in 1892-93. These rules, after the test of a decade, have been somewhat modified and extended, and today represent the most carefully considered and most practical scheme for securing uniformity of procedure in naming plants that has yet been brought forward. Whatever may be thought of these rules, or of any other, it is certainly the part of wisdom to test their applicability, and lend a hand to their improvement.

In order to illustrate the American rules I propose to take the very interesting case of the genus *Puccinia*. As the name is generally used it embraces about one thousand species of plant rusts, which are characterized by having free, two-celled telentospores. In my paper* of four years ago I pointed out, that according to the Kuntzean rules of nomenclature this generic name should be transferred to the cedar apple rusts, to replace *Gymnosporangium*, a name that has been in use since 1805. In my second paper,† presented two years later, I showed that if we accept the

* Indiana plant rusts, listed in accordance with latest nomenclature. Proceedings Indiana Academy of Science for 1898:174-186.

† Generic nomenclature of cedar apples. Proceedings Indiana Academy of Science for 1900:131-136.

first species published under a new genus as the type species to which the genus is to be invariably anchored, and from which its essential characters are to be drawn, the cedar apples must be listed under the Linnæan genus *Tremella*, while the fate of the name *Puccinia* was left in doubt.

In the meantime the amended rules of nomenclature by the American Committee have been distributed, and although these recognize the great value of types, a specimen used by the author as type of the species, and a species as type of the genus, they provide other ways of determining the type of a genus than always taking the first species named under it. The new rules require that the intent of the author, or if that is not ascertainable, the usage of his followers, shall be respected.

If we examine the status of the three genera, *Tremella*, *Gymnosporangium* and *Puccinia*, under the present rules, we will find that the first becomes a genus of algæ, not longer to be included among the fungi, the second is restored to the position it has long occupied, while the third is well nigh lost in the toils.

The name *Puccinia* was introduced into botanical literature by Micheli in 1729, and is consequently pre-Linnæan. It was employed by Haller in two different works prior to 1753, the initial date for the operation of the law of priority, and by the same author in his *Historia stirpium indigenarum Helvetiæ inchoata* (Vol. III, p. 126) of 1768. The last work, however, does not employ binomial names, and is not to be used in establishing modern nomenclature. Another early author, who cites the name *Puccinia*, is Adanson in his *Familles des Plantes* (Vol. II, p. 8) of 1763. He adopts both the name and the description of the genus from Micheli, but does not mention any species. There is a failure, therefore, to establish the genus on account of the lack of a type species.

The next oldst author to employ the name is Willdenow in his *Floræ Berolinensis*, of 1787. Willdenow characterizes his genus *Puccinia* as follows: "*Corpus cylindraceum seminibus caudatis radiatim positis, elastice exsilientibus farctum.*" Under this genus he places a single species, *Puccinia simplex*, which is described as "*P. corpore cylindrico simplicissimo obtuso.*" It is said to occur on the trunks of plum trees *(Prunus armeniacæ)* in autumn, and to be rare in the vicinity of Berlin. Although reference is made to Micheli, yet careful comparison shows conclusively that Willdenow's plant was different from that of the Italian author. Moreover, it could not have been one of the cedar apples

(Gymnosporangium), as pointed out by Magnus,* for they neither grow upon the plum nor produce their spores in autumn. Further confirmation of this is found in Roth's *Floræ Germanicæ*, the first volume of which was issued the year following the appearance of Willdenow's work. In this volume (p. 547) *Puccinia simplex* is given, and credited to Willdenow, with no reference to Micheli, while a few pages farther on in the volume the common cedar apple of Europe is listed as *Tremella juniperina*. The two were evidently considered by the author to be distinct fungi.

There seems to be no doubt, that according to our present form of procedure, we must consider that the genus *Puccinia* was established by Willdenow in 1787, with the single species, *P. simplex*, a species that does not belong to the *Uredineæ*. What fungus Willdenow had in hand, I am not prepared to say. The description fairly well applies to *Cornularia Persicæ* (Schw.) Sacc., but that is a North American fungus, common in America but not yet reported from Europe. So far as our present purpose is concerned, however, it is enough to know that the type of the genus *Puccinia* is not uredineous. Therefore, the largest and best known genus of plant rusts, the one that includes the chief economic species, drops entirely out of the extensive family of the *Uredineæ*. Probably Doctor Kuntze is to be followed in placing under Dicæoma the species that have heretofore been listed under *Puccinia*, as I have already pointed out in my preceding paper before the Academy.

Whether this is the final word regarding the genus *Puccinia*, and the fungi which it has been used to cover, yet remains to be seen. It may appear foolish to some to relegate to obscurity a well known and long established name, upon what seem to be technical grounds. But the loss of a familiar name should not stand in the way of the introduction of definite rules which will lead to a reasonably permanent nomenclature. What is most desired is that the period of trial and transition shall be as short as possible, and to assist in bringing this about the study of the genus Puccinia is herewith presented.

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* Bot. Centr., Vol. LXXVII, p. 5.

Forestry Conditions in Montgomery County, Indiana.

Samuel J. Record.

The recent interest in forests and forestry problems in Indiana makes it very important that every one collecting accurate information regarding the forestry conditions in any part of our commonwealth, present in as complete a manner as possible everything that may be of general importance in arousing public interest and at the same time serve as a basis for intelligent work in that particular part of the State.

The writer has studied with some degree of thoroughness the conditions in Montgomery County, which conditions, as revealed by the following facts, demonstrate the very serious nature of the problems we are confronting and the lines for future work.

Montgomery County is located in the middle western part of the State and contains 504 square miles, or 322,560 acres. Owing to its large size, its prominent location and the diversity of its surface and soil it may well be considered as a typical section of the central part of Indiana. Hence, what may be said of the forestry conditions and the plans and possibilities of its reforestation may in a general way be considered true of the whole central portion of the State.

The surface of the county is pleasantly diversified. The western and central part near the principal streams is hilly and broken, in the north central it is gently undulating and at the east and southeast flat and level. The northern part of the county is notably a prairie region, level or gently rolling.

The drainage takes direction from the dip of the underlying rocks generally a little west of southwest. The main stream is Rock River or Sugar Creek, which enters south of the northeast corner and traversing the central area, passes out six miles north of the west corner of the county. Its tributaries from the north are Black and Lye creeks; from the south, Offield, Walnut and Indian creeks. The southern and southeastern parts are drained by Big and Little Raccoon creeks and at the southwest by Coal Creek, which flows directly into the Wabash.

The early settlers found the county one vast forest, broken only by the wind swept streak of the cyclones or the marshy land of the prairies. So dense was the wilderness that their way had to be cut with the axe. Trees and saplings were cut and their trunks made into corduroy roads.